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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,286	02/26/2002	Atsushi Takane	H6808.0004/P004	5346

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EXAMINER
JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/082,286	TAKANE ET AL.
	Examiner	**Art Unit**	
	Phillip A. Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>05 May 2006</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-25</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>26 February 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

1. This Office Action is submitted in response to RCE / Amendment filed 5-5-2006, wherein claims 1,24, and 25 have been amended. Claims 1-25 are pending.

Claims Rejection – 35 U.S.C. 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,363,167 to Miyano and Ito, U.S. Patent No. 6,108,033, in view of Lin, U.S. Patent No. 6,292,582.

Miyano (167) discloses the following;

(a) The SEM, shown in Figure 3 below first scans an electron beam 105 across the measurement area and patterns present in the measurement area are processed to an SEM image. After, the templates 11 to 13 and an actual SEM image of the measurement area are read into an image processor 106, the actual SEM image is subjected to pattern matching with each of the templates 11 to 13, and correlation

coefficients between the actual SEM image and the plurality of image templates are

calculated, with the coefficients being compared to determine the maximal coefficient,

which is selected as the best match. The templates 11 to 13 are made from actual

SEM images on patterns or images obtained by lithography simulation from CAD data,

as recited in claims 1-5,7-9,11, 24, and 25. See Column 4, line 40-67; Column 5, line
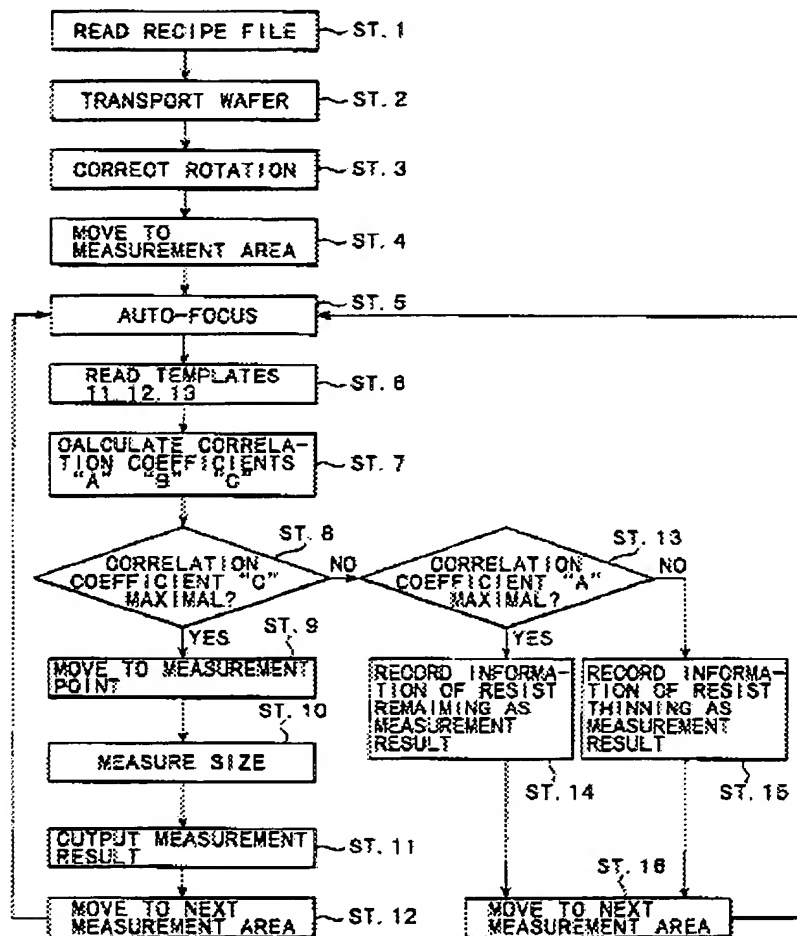
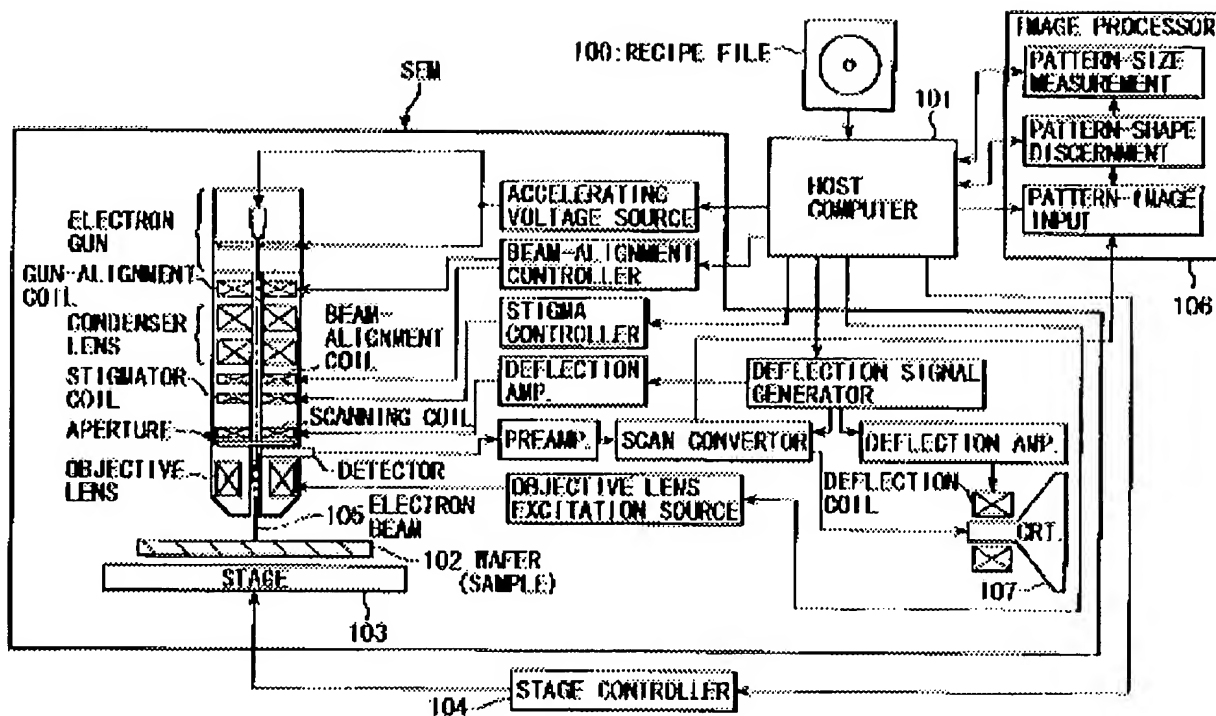1-40; Figure 2 and Figure 3 below;

FIG. 2

FIG. 3

(b) The SEM also includes storage medium 100, where information necessary for the measurement such as templates 11 to 13, measurement points which are targets for a plurality of measuring areas set on wafers in addition to the execution program is stored. The execution program, templates, other information necessary for the measurement are called a measurement recipe and the storage medium 100 in which measurement recipes are stored is called a recipe file. The recipe file 100 is prepared for each fine pattern in measurement. The use of recipe file 100 is equivalent to the capturing and inspection condition file, as recited in claims 19-23. See Column 4, line 45-58.

(c) Gray scale comparison is performed between an actual image and the template by subtracting a gray level in an area of the template from the gray level in the same area of the actual SEM image, as recited in claims 1,24, and 25. See Column 7, line 4-21.

(d) The use of secondary electron images obtained from the edge 2 of a photoresist pattern and a reference numeral 3 indicates a secondary electron image obtained from a part other than the photoresist patterns (a substrate). A method in which differentiation processing on an image is performed in a designated area and a "contour" is determined to be a line which is made by connecting points in the image having the highest gradient of change in gray level, as recited in claims 12-15. See Column 4, line 33-40; Column 8, line 1-29; and Figures 1A-1C below;
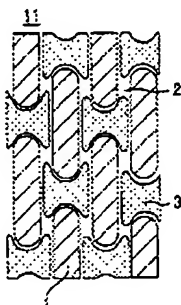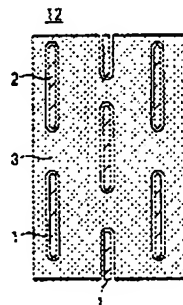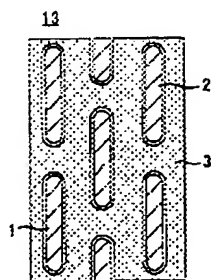
FIG. 1A

FIG. 1B

FIG. 1C

Miyano (167) as applied above fails to teach a scanning electron microscope image, wherein a portion of the image that corresponds to the template is re-registered as a new template in place of the bitmap based on the design information, as recited in claims 1,15,24, and 25. However, Ito (033) discloses an image processing apparatus and method where an object to be monitored picked up by an image pick-up unit, including a first step for producing a difference between an input image including a background image and an image of the object to be monitored from the image pick-up unit and the background image, as an image of the object; a second step for dividing the image of the object into a plurality of parts to produce a plurality of divided images of the object as a plurality of templates, a third step for matching each of a plurality of templates with a new input image and detecting a plurality of parts of the new input image having highest degrees of matching with the templates and a fourth step for updating the new templates using the parts of the new input image having the highest degrees of matching as a plurality of new templates. The fourth step is sequentially executed for new input images to sequentially update the templates to trace the object, as recited in claims 1,15,16,24, and 25. See Column 3, line 40-57.
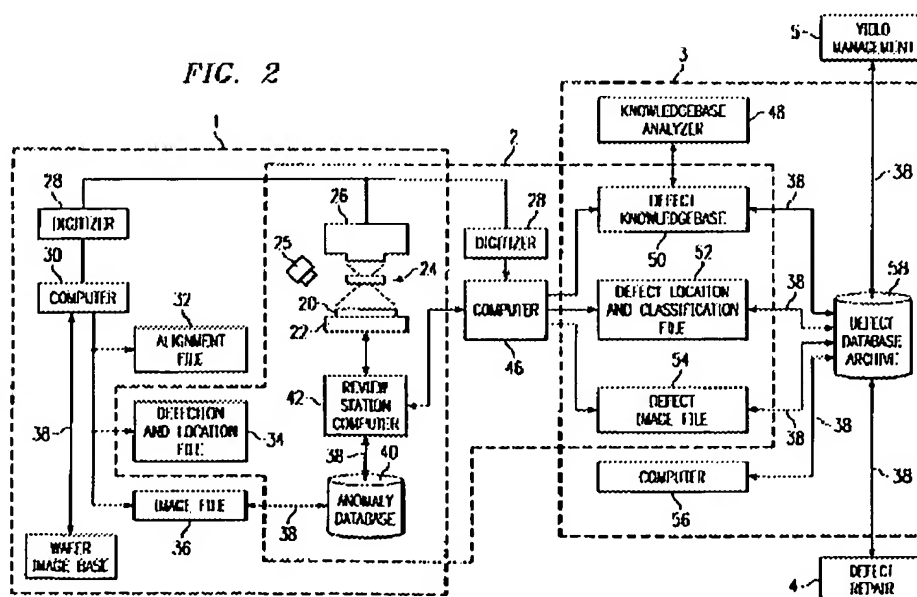
Therefore it would have been obvious to one of ordinary skill in the art that the SEM measurement system and method of Miyano (167) can be modified to use the template registering method of Ito (033), to provide sequential updating of templates so that the stable matching is attained.

The combination of Miyano (167) and Ito (033) fails to teach the use of an inspection system that includes a function to retrieve and store design data, as well as

transmitting data to other SEM systems via a network, as recited in claims 2-7, and 10.

However, Lin (582) discloses;

(a) A defect detection and locating system in Figure 2, wherein a semiconductor

wafer 20 is placed on an xy stage 22 so that an area of the wafer 20 is illuminated by

an energy source 25 that produces energy such as white light, darkfield light, polarized

light, laser refraction, scanning electrons, focused ion beams or X-ray such that

anomalies on the wafer can be detected using a microscope 24 or other sensor

device. A camera 26 or other image capturing device captures the microscope's 24

image while a digitizer 28, such as a frame grabber or other means of converting the

image generated by the sensor from analog to digital form, supplies a digitized

(bitmap) rendering of the image to an anomaly detecting-and-locating computer 30, as

recited in claims 2-7, and 19-23. See Column 4, line 61-67; and Figure 2 below;

FIC. 2

(b) Yield management system 5, retrieves and analyzes information from the defect database/archive 58 and other information resources available on the network 38 and from other sources such as CAD Computer-Aided Designs, results of electrical tests carried out on wafers, wafer inspection reports and images, histories of defects, process models, wafer process histories, and packaged die failure reports, as recited in claims 2,6, and10. See Column 8, line 2-19.

Therefore it would have been obvious to one of ordinary skill in the art that the measurement system of Miyano (167) and Ito (033) can be modified to use the resitive element forming method of Lin (582), to provide a method of storing, indexing and retrieving information, thereby providing rapid retrieval and access to the large amount of stored defect and image information so that files may be retrieved by other stations and systems connected to the network.

Conclusion

4. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 6:30 am to 3:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 703 872 9306.

Information regarding the status of an application may be obtained from the

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

PJ

June 15, 2006

NIKITA WELLS
PRIMARY EXAMINER

06/16/06